



# UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE  
United States Patent and Trademark Office  
Address: COMMISSIONER FOR PATENTS  
P.O. Box 1450  
Alexandria, Virginia 22313-1450  
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/556,907	11/15/2005	Shuichiro Yamamoto	33000-000007/US	1859
30593 7590 03/19/2008 HARNESS, DICKEY & PIERCE, P.L.C. P.O. BOX 8910 RESTON, VA 20195			EXAMINER PARK, KINAM	
			ART UNIT 2828	PAPER NUMBER
			MAIL DATE 03/19/2008	DELIVERY MODE PAPER

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

<b>Office Action Summary</b>	<b>Application No.</b> 10/556,907	<b>Applicant(s)</b> YAMAMOTO ET AL.	
	<b>Examiner</b> KINAM PARK	<b>Art Unit</b> 2828	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2008.
- 2a) ☒ This action is **FINAL**.                      2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1 and 3-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892)                     | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____                                      |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)          | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____  | 6) <input type="checkbox"/> Other: _____                          |

## **DETAILED ACTION**

### ***Response to Amendment***

1. Examiner acknowledges and accepts amendments made to the claims, filed on January 22, 2008:

Claims 1 and 3-7 are pending; and

Claim 2 has been cancelled.

### ***Response to Arguments***

2. Applicant's arguments, filed on January 22, 2008, have been fully considered but they are not persuasive.

Applicant's arguments on pages 4-6,

1) pertaining to claim 1, where Applicants therefore submit that Uchida teaches "an electrical insulator having a larger thermal conductivity of the submount," not a "submount being made of a material having a thermal conductivity higher than that of a material used to form said electrically conductive material" as recited by claim 1. Therefore, even the combination of Hanoaka and Uchida fails teach or suggest all limitations of claim 1, and cannot establish a prima face case of obviousness according to M.P.E.P. §706.02(j).

However, it is the examiner's interpretation that Hanaoka (primary reference) disclose in specification that the submount 102 may be made of any other material that has a thermal expansion coefficient higher than that of GaN, for example, from among the materials listed in Table 1(see, paragraph [0049] of Hanaoka) including "Al"; thereby Hanaoka and Uchida teach the limitations as recited by claim 1.

***Claim Rejections - 35 USC § 103***

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 1, 3-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hanaoka (Pub No. 20030067950) in view of Uchida (US 6301278).

Regarding **claim 1**,

Hanaoka discloses in figure 2 and specification:

1. A nitride-based semiconductor light-emitting device, comprising a nitride-based semiconductor light-emitting element chip (103) formed on an electrically conductive substrate (1), and a submount (102), solder (107), and a stem (101) each serving as a mount member identified as a supporting base for mounting the nitride-based semiconductor light-emitting element chip, said submount (102) being made of a material having a thermal conductivity higher than that of a material used to form said electrically conductive material (see, Abstract), wherein

said nitride-based semiconductor light-emitting element chip, in which a nitride-based semiconductor layer and a first electrode (4) are formed in succession on a surface of the electrically conductive substrate (1) and a second electrode (3) having a conductivity type different from that of the first electrode (see, paragraph [0027]) is formed on a rear surface of the electrically conductive substrate, is mounted on the submount (102) by allowing its second electrode (3) side to face the submount and

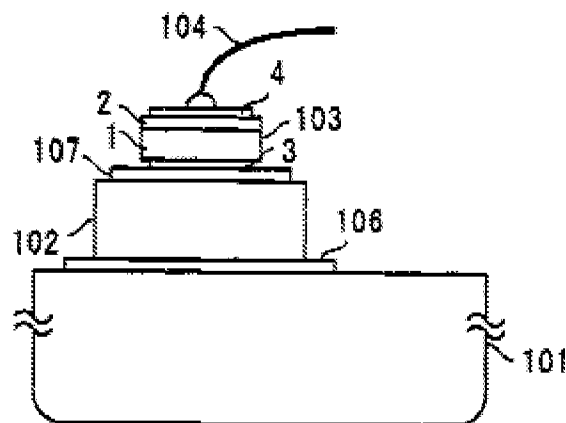
allowing a first solder (107) material to be interposed therebetween, and said submount having said nitride-based semiconductor light-emitting element chip mounted thereon is further mounted on the stem (101) by allowing its submount side (102) to face the stem and allowing a second solder (106) material to be interposed therebetween.

However, Hanaoka is silent as to a submount made of AlN.

Uchida discloses the use of a submount made of AlN (see, col.2, lines 36-42).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time of invention to combine the a submount made of AlN of Uchida with a nitride-based semiconductor light-emitting device of Hanaoka because this provides the thermally conductive submount instead of silicon (see, col.2, lines 36-42 of Uchida).

**FIG. 2**



Regarding **claim 3-7**,

Note that Hanaoka discloses in figure 1 and specification a first solder material made of AuSn and the second solder material made of SnAgCu (see, paragraph [0042]) (**claim**

3), the electrically conductive substrate of an n-type nitride based semiconductor substrate (see, Abstract) (**claim 4**), the second electrode made by forming on the electrically conductive substrate three layers (claim 6) having a first layer containing at least two types of metal selected from Ti, Hf, and Al, a second layer having a layered structure formed by Mo and Pt in this order, and third layer using Au (see, paragraph [0033]) (**claim 5,6**), the electrically conductive substrate dry-etched as preprocessing (see, paragraph [0032]) (**claim 7**).

### ***Conclusion***

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Wakisaka et al. (US 6760352) discloses the semiconductor laser device with a diffraction grating and semiconductor laser module.

6. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Art Unit: 2828

7. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kinam Park whose telephone number is (571) 270-1738. The examiner can normally be reached on from 9:00 AM-5:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, **MINSUN HARVEY**, can be reached on (571) 272-1835. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300. Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/K. P./

Examiner, Art Unit 2828

/Minsun Harvey/

Supervisory Patent Examiner, Art Unit 2828